



3R Guidebook for Shopping Malls

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About this Guide

This 3R Guidebook is produced by the National Environment Agency (NEA) to help shopping malls assess their current waste management practices, and identify opportunities to reduce, reuse and recycle waste materials so as to reduce waste disposal needs. By adopting the 3Rs (reduce, reuse, recycle), shopping malls can potentially reap savings in disposal cost while contributing towards environmental sustainability.

This guide is intended primarily for commercial property owners, property managers and employees of shopping malls who are involved in the planning and implementation of recycling and waste reduction plans. Waste management companies and recycling service providers can also refer to this document to map waste reduction plans and targets for their customers in the retail industry.

What can be learnt from this Guide?

This guide does not provide a “one size fits all” solution to developing the best recycling and waste reduction programme for shopping malls. Rather, it seeks to provide general concepts and factors for consideration during the planning phase.



CHAPTER 1: INTRODUCTION

Overview of Solid Waste Management in Singapore

Over the years, Singapore's waste disposal quantities have been increasing significantly. From 1,260 tonnes per day in 1970, this rose to 8,289 tonnes per day in 2013 and is projected to continue to increase in tandem with an increasing population, economic growth, affluence and changing lifestyles. Since 1979, much investment has gone into the building of waste-to-energy incineration plants (WTE IPs) and sanitary landfills to manage the increasing amount of waste disposed.

WTE IPs are designed to incinerate waste safely and are equipped with air pollution control equipment. These plants reduce the volume of waste by up to 90%, while simultaneously generating energy in the form of electricity. Ferrous metals are also extracted from the ash as by-products and sent for recycling. The remaining ash is then transported to Semakau Landfill, the only offshore landfill for Singapore.

If waste generation continues to grow unabated, there would be a need to build more incineration plants and offshore landfills. This presents a key challenge for land-scarce Singapore.



CHAPTER 1: INTRODUCTION

Strategies for Sustainable Solid Waste Management

A small city-state with limited living space, Singapore has to ensure prudent use of land for continued economic growth. Building more waste disposal facilities to handle the increasing amount of waste disposed will mean less land for other uses such as industries, housing, water catchment areas, transportation and recreational purposes.

Recognising the need to reduce waste disposal, the then Ministry of the Environment had been promoting waste minimisation since 1991. The National Environment Agency (NEA), a statutory board formed in 2002, has also adopted waste management strategies based on the 3Rs, that is, Reduce waste at source (or waste avoidance), Reuse waste, and Recycle waste.

An Inter-Ministerial Committee on Sustainable Development (IMCSD) that was set up in January 2008 to develop key strategies for Singapore's sustainable development, produced a Sustainable Singapore Blueprint which, among other goals, set a target for Singapore to improve the overall waste recycling rate to 65% in 2020 and 70% in 2030.

To achieve these targets, NEA will continue to engage and work in partnership with various organisations in the people, private and public sectors to educate, plan and implement waste minimisation and recycling programmes.

What Shopping Malls can Do

Shopping malls produce significant quantities of waste with great potential for the successful implementation of the 3Rs.



CHAPTER 2: BENEFITS OF REDUCING, REUSING AND RECYCLING WASTE

What are the 3Rs?

The 3Rs stand for:

- **Reducing** waste - cutting or preventing waste at its source; change to a product or a process that reduces the generation of waste
- **Reusing** waste - using an item or material more than once; and
- **Recycling** waste - processing a discarded material into a new product or resource

In the broadest sense, 3R practices encompass all measures that minimise the amount of waste materials disposed of. The preferred waste management practice is to **reduce** waste at source, i.e. to prevent waste from being generated. Only in cases where waste generation cannot be prevented should options be explored to **reuse** the waste, followed by **recycling** of the waste.



Benefits to Shopping Malls

Good waste management is good business management. The benefits of practising the 3Rs go beyond reducing waste to landfill. It also yields many positive outcomes such as:

1. Reduced Disposal Costs

Practising waste minimisation in any area of a business process can help reduce business costs. This can be achieved through improving resource-use efficiency and reducing wastages, thereby cutting down waste handling and disposal costs.

2. Enhanced Corporate Image

Shopping malls with effective waste minimisation and management programmes will be able to set themselves apart in the marketplace as responsible and forward-looking product and service providers who are sensitive to environmental issues.

This could be an advantage as public awareness on environmental issues is growing and the environmental profile of a shopping mall is an increasingly important part of its overall reputation.

CHAPTER 2: BENEFITS OF REDUCING, REUSING AND RECYCLING WASTE

Benefits to the Environment

Practising the 3Rs is an essential and effective way to protect and conserve our environment for the benefit of present and future generations. Reducing or minimising waste at source eliminates the generation of excess waste and utilises less virgin resources, thereby conserving limited natural resources. Similarly, used products can be reprocessed into new materials through recycling so that the use of raw materials and resources is reduced. An effective waste minimisation programme will help to reduce shopping malls' carbon footprints and impact on the environment.



Benefits to Singapore

As a nation, despite recycling, Singapore has been setting aside more and more resources, including land to build disposal facilities, to manage the growing waste quantities. For instance, in 2013, Singapore disposed of 3.03 million tonnes of solid waste, which was enough to fill almost 5,800 Olympic-size swimming pools. This amount would have been significantly higher if Singapore had not also recycled about 61% of the total waste generated. Through the practice of the 3Rs, shopping malls can contribute towards waste reduction and resource conservation, and help extend the lifespan of our landfill and move a step closer to sustainable waste management.



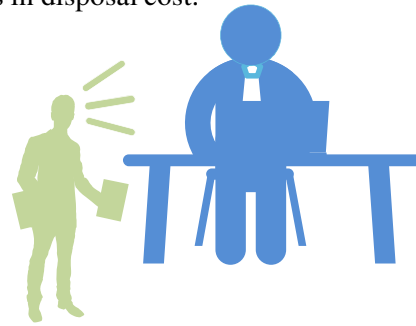
CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

There are nine crucial steps for the implementation of a successful 3R programme at your mall.

Step 1: Property Management to Commit to 3R efforts

The support of the property management is essential for the success of any 3R Programme, as 3R initiatives would require an initial investment in time and possibly finances. The new programme could also entail changes in responsibilities of some employees or to operational procedures. A supportive management is crucial to the alignment of the environmental outlook and perspective of employees and retail tenants. Therefore, the first step is to secure and project a clear and strong signal of the management's commitment to supporting any 3R efforts.

Next, there is a need to collect data on the amount of waste generated at the mall, identify the opportunities to reduce, reuse and recycle waste, estimate the cost of wasted raw materials/consumables, and estimate the potential savings in disposal cost.



3R Policy Statement

There is a need to produce a 3R policy statement, which communicates the objectives of the 3R Programme to employees, and may include these main points:

- 1) Reduce waste at source to eliminate waste is one of the main goals in different operations of the shopping mall;
- 2) Reuse and recycle as much waste materials as possible before disposing them as waste.

In the policy statement, you may also want to convey certain motivations for practising the 3Rs, such as service quality improvement, cost reduction, and being an environmentally-responsible corporate citizen. The 3R policy statement can be part of your mall's overall Environmental Policy.

CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

The following is an example of a policy statement. You may use it as a reference to amend accordingly for your own use.

Example of a Policy Statement

1. [Name of Shopping Mall]'s policy is to reduce all waste to the minimum levels that are economically and technically feasible;

As both a responsible citizen and [Name of Shopping Mall]'s employee, each individual is responsible for reducing waste, and for complying fully with all 3R programme goals established by the mall;

Employees are urged to come forth with suggestions for further reducing waste in their own work areas, and in any other areas where they may be familiar with.

2. [Name of Shopping Mall] is committed to excellence and leadership in protecting the environment. In keeping with this policy, our objective is to reduce waste. We strive to minimise adverse impact on the environment, through excellence in waste reduction. By successfully reducing waste at its source, we can achieve cost savings, increase operational efficiencies, improve the quality of our services, and maintain a safe and healthy workplace for our employees. [Name of Shopping Mall] promotes environmentally sound measures to reduce, reuse, and recycle waste.

Signature _____ Date _____

Position in Shopping Mall Management Team _____

The signed policy statement is to be displayed prominently to disseminate the information to all employees.

It would be desirable to convene a special meeting to explain the rationale and/or disseminate the information through other staff channels. At the same time, the meeting would be a good platform to seek feedback and ideas from employees and retail tenants. This will send a positive signal and the stakeholders are more likely to get involved and conform to the policy rules.

Step 2: Property Management to Appoint a 3R Coordinator

The next step is for management to appoint a competent 3R Coordinator. The 3R Coordinator should be an enthusiastic person with a passion for protecting the environment. He or she should possess strong leadership, communication and organisational skills, and has good rapport with a broad range of employees from different departments (e.g. landscaping, housekeeping, transportation, and procurement), retail tenants, recycling service providers, and the general public. He or she should be knowledgeable about the mall's operations, as well as its procurement and waste management procedures.



CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Step 3: Property Management to Form a Green Committee

The formation of a Green Committee or a 3R Team helps to ensure success of the waste reduction programme. Together with the 3R Coordinator, they will plan, develop and implement a 3R programme for the mall. The 3R Team should be well represented in terms of experience, knowledge and perception of waste management issues, and should comprise a mix of centre management employees (from different departments of the mall's management such as human resource, facilities management, and housekeeping), tenants and recycling service providers.

Housekeeping staff should be involved in the planning of the 3R programmes, as they are involved in waste management operations and are pivotal to the successful implementation of the programme.

Tenants' inputs are valuable in the selection of waste streams for recycling and designing the collection arrangement for the recyclables. Recyclables collection logistics should be made as convenient as possible.

Lastly, work with your recycling service provider to determine the storage location of for the collected recyclables and the frequency of scheduled collection.

Role of the Green Committee

The suggested functions of the Green Committee are:

1. Plan, develop and implement a 3R programme specific to your shopping mall, including:
 - Setting of the mall's 3R programme goals and targets
 - Establishing 3R procedures to complement operational practices of the mall
 - Organising programmes to train employees in the 3Rs
 - Organising regular activities to raise overall awareness of the 3Rs
 - Engaging partners and customers in 3R initiatives
2. Work out and propose a budget for the mall's 3R programme
3. Conduct waste audits to:
 - Determine baseline waste tonnage and composition
 - Identify areas where waste can be reduced
 - Monitor waste output over time
4. Monitor compliance with the established 3R procedures
5. Generate progress reports in meeting the mall's 3R programme goals and targets
6. Evaluate effectiveness of the mall's 3R programme

The Green Committee should meet regularly to track the progress in implementing 3R initiatives, and brainstorm for new initiatives to cut waste.

CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Step 4: Green Committee to Conduct a Waste Audit

A waste audit is a structured process used to quantify the amount and types of waste generated. The objective is to profile the waste generated in the mall by:

- Types of waste stream
- Quantity of each waste stream
- How the waste was generated
- Why the waste was generated
- Where the waste was generated; and
- How the waste was managed after being generated



Conducting a waste audit helps to identify areas of wastage, uncover the recycling opportunities at your shopping mall and estimate potential revenues from the sale of recyclables. The data collected can also be used as a baseline for measuring the effectiveness of the 3R programme.

There are different ways to conduct a waste audit. Some malls might choose to hire the services of a waste management company or contractor to perform the audit. Others might carry out the audit in-house.

Generally, large amounts of waste are usually generated at the following areas:

- Food courts and restaurants
- Supermarkets
- Offices and business centres
- Shipping and receiving departments

A waste audit for each area can help to identify opportunities to reduce, reuse and recycle waste. You may follow the steps below to conduct a waste audit.

(a) Conduct an inspection of each area

Work with the individual tenants to walk through the various operational areas in your mall on different days of the week and make a visual inspection of the contents of the refuse bins. Take note of the types of waste in these bins. Gather information from relevant operational staff, and document findings. Pay attention to areas and operations that tend to generate the largest amount of waste. Create an audit checklist and indicate the different types of waste streams observed during the inspection. A sample audit checklist is provided on the following page.



CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Table 1: Audit Checklist for e.g. supermarket

Types of Waste	Point of Origin	How is it Managed?	Quantity Disposed (kg/month)	Cost of Disposal	Quantity Recycled (kg/month)	Cost of Recycling
Paper						
Carton boxes/ cardboard packaging						
Plastic packaging						
Glass						
Ferrous metal						
Aluminum cans						
Food waste						
Garden waste						
Others						
TOTAL						

(b) Collect Waste Samples from each area

On pre-determined days of the week, collect a number of waste samples from each area of the mall, such as food courts, supermarkets, retail shops, offices, business centres, shipping and delivery departments, etc.

To ensure that the waste samples collected are representative, collect a full week's samples for each area. To avoid confusion, you may wish to collect waste samples from different areas on different weeks. For instance, collect waste samples only from food courts for sorting and recording in week 1, and collect waste samples from another area (e.g. supermarkets) in week 2.

Give clear instructions to staff or cleaners collecting the waste samples, such as details on the locations of the refuse bins, the labelling of the collection bags / bins for identification and types of waste to be recorded. Supervisors should pay close attention during the waste sampling process.

(c) Sort the Waste

After waste samples are collected, labelled and recorded, they are emptied onto a large plastic sheet placed on a flat ground. The waste materials from each area can then be sorted into different types (paper, plastic, metal, glass, etc.) according to the audit checklist.

(d) Analyse the Data

Each sorted type of waste is then weighed and recorded. Data indicating the quantities of the different types of waste generated at each area of the premises can be obtained.

CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

In certain situations, waste may not be observed in the refuse bins during a waste audit, but could have been identified as possible waste materials from purchasing records. The types and quantities of such waste materials could be estimated based on the volume of materials purchased during the year.

Analyse each waste stream and document how these wastes are generated, why they are generated, at which point they are being generated, and how they are managed after being generated. These analyses will be useful when developing 3R strategies and procedures.

Step 5: Green Committee to Evaluate Opportunities to Reduce, Reuse and Recycle

Identify opportunities for intervention and develop strategies and procedures for 3R outreach and initiatives to target each waste stream.

The waste reduction/avoidance and reuse tips listed below are a compilation of the initiatives from overseas malls. You may select those that you find appropriate for your mall. As some of these may result in higher water or energy usage levels, malls may wish to conduct a cost-benefit analysis for each option before embarking on the selected initiatives.

Tips on Waste Reduction

Product Design and processes

- Where possible, encourage change in processes to reduce material consumption
- Encourage the use of reusable and refillable products

Packaging Materials

- Avoid the need for plastic shrink wrapping
- Encourage suppliers to provide crates instead of disposable pallets
- Discourage the use of polystyrene boxes and filling
- Negotiate with suppliers to remove unnecessary packaging from products
- Encourage retailers to use products made of recyclable material and/or packaged in recycled material
- Encourage the use of non-disposable cups, plates and utensils in food courts

Materials Savings

Waste reduction initiatives in the office:

- Encourage the use of recycled paper
- Organise collection of used office paper for recycling
- Print documents on both sides of the paper
- Reuse the blank side of used paper for notes or in-office memos
- Recycle used printer cartridges
- Limit printouts to necessary items only



CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Tips on Reusing

Packaging Materials

- Encourage suppliers to provide reusable plastic crates instead of disposable cardboard boxes
- Identify and encourage suppliers/retailers to reuse cardboard boxes or other 'waste' products
- Encourage suppliers and retailers to look at alternatives such as refills in original containers
- Encourage the use of reusable shopping bags instead of single-use plastic carrier bags



Tips on Waste Recycling

Identify Waste that can be Recycled

For waste materials that cannot be reduced or reused, check with local recyclers if they can be recycled, and work with collectors to develop a recycling programme.

Recyclable wastes generally found in a shopping mall include:

Paper waste: Computer paper, corrugated cardboard boxes, newspapers, telephone books, magazines, brochures, shoe boxes,

Metal waste: Used aluminium cans and foils, tin and steel cans and containers

Glass waste: Used glass bottles and jars

Plastic waste: Mineral water bottles, soy sauce bottles, detergent bottles, food containers, food and goods packaging, shrink wraps, plastic garment bags, CDs, DVDs

Used cartridges: Copier and printer cartridges

Other waste: Used wooden pallets

CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Setting up a Recycling Network

Evaluate the existing recycling infrastructure in place and ensure that a comprehensive and convenient network of recycling bins is set up to facilitate recycling among shoppers and tenants.

Distinct Bin Design

The design of your recycling bin should be easily distinguished from refuse bins. A good recycling bin design includes clear labelling, is colour-coded and comes with customised bin lid openings for easy identification and proper usage by shoppers and tenants.



Segregated or Commingled Recycling Bins

Recyclables can be collected in segregated or commingled recycling bins. Malls can use either type depending on the collection method of the recycling service provider.

Segregated recycling bins can be provided for different types of materials such as metal (aluminium), plastics, paper, and glass. Bins with openings that are appropriately shaped for each type of recyclables can also potentially reduce contamination of the recyclables as shoppers will be reminded of the shape of the recyclable which can be deposited in the bin.

Segregated recycling bins will occupy more space in the mall. The recyclables would also have to be separately collected, possibly resulting in higher collection costs. However, the value of properly sorted recyclable waste is generally also higher.

In a commingled recycling programme, all recyclable materials are collected and mixed/stored together, with the exception of paper and cardboard carton boxes which have to be stored separately to be kept clean and dry. Commingled recyclables are sent to the MRF where they are sorted and baled. This system requires fewer recycling bins, and occupies less space. Though the collection efforts by cleaners can be reduced, higher recycling service fees might be incurred, as the contractor will have to sort the recyclables backend. The value of commingled recyclables might also be lower than sorted recyclables.



CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Locations for Placement of Recycling Bins

Bins should be placed in conspicuous and strategic locations where shoppers and tenants can conveniently deposit their recyclables. Some examples of strategic locations include:

- Bins for paper and/or ink cartridges in the photocopy room, offices, business centres
- Bins for aluminium/glass/plastic near food courts
- Bins for electronic waste in the storage room
- Bins for corrugated cardboard boxes in shipping/loading and unloading area
- Bins for paper/plastic/metal waste beside escalators and/or lifts

Recycling bins should also be co-located with refuse bins for users to conveniently separate the recyclables from the rest of their waste.

Education and Raising Awareness

In partnership with recognised environmental organisations, such as NEA:

- Organise events to raise public awareness on the 3Rs
- Provide information to retailers and shoppers to encourage the 3Rs



Step 6: Green Committee/Property Management to Select a Recycling Service Provider

After you have identified the amount of potential recyclables in the waste generated, you can select a recyclables contractor to provide recycling bins and collection services.

There are a number of recycling companies in Singapore that accept different types of common recyclables. Some waste disposal contractors are also able to provide recycling services. You can either engage a contractor who can provide both recycling and waste disposal services, or engage separate contractors who can provide recycling and waste disposal services separately.

(a) Costs of Waste Collection Services

There are 3 main cost components for the provision of waste collection service:

- **Container Rental Fee** - This is the monthly fee charged by the contractor for rental of a compactor/open top container/waste bins on-site.
- **Haulage Charge** - This is the fee charged by the contractor for collecting and transporting of waste to an incineration plant or the landfill.
- **Disposal Tipping Fee** - This is the fee charged by an incineration plant / landfill for disposal. It is based on the weight of the waste collected from the mall and the contractor will pass on this fee to the mall. As of January 2015, the disposal fee is \$77 per tonne. The updated fee standard can be checked via the link below:

<http://app2.nea.gov.sg/energy-waste/waste-management/refuse-disposal-facility>

CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

(b) Costs of Recycling Services

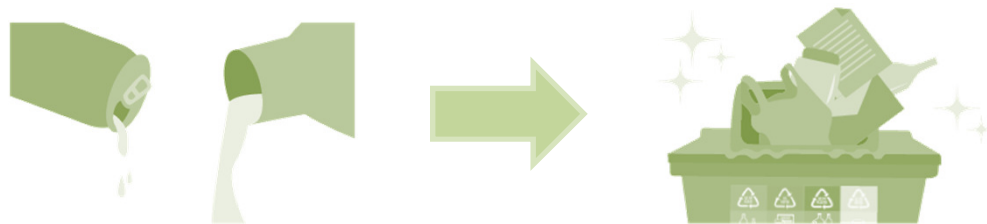
Apart from 3 main cost components, revenue can be derived from the sale of the recyclables. The cost of providing recycling services include the aggregate of the following components:

- **Container Rental Fee** - This is the monthly fee charged by the contractor for rental of large recycling bins on-site.
- **Haulage Charge** - This is the fee charged by the contractor for collecting and transporting recyclables to the Material Recovery Facility (MRF) or to recycling companies for processing.
- **Processing Fee** - This is the fee charged by the MRF/recycling companies for sorting, baling and processing the recyclables.
- **Revenue** - There is a market for sorted and/or processed recyclables, where the MRF/recycling companies derive revenue from.

If the value of the sorted and/or processed recyclables is greater than the combined cost components, the contractor may be able to transfer some savings to the client. If the combined cost components are higher than the revenue, the contractor might charge a fee for the recycling services, which may be lower (or equal to or higher) than the disposal fee.

A list of recycling companies for mixed and individual waste streams can be found in this link: <http://app2.nea.gov.sg/energy-waste/recycling/collectors-traders-for-recyclables>

The waste recycling and collection business is a highly competitive business. When sourcing for contractors to provide recycling services, you may like obtain a few price quotations before selecting the one(s) which best represents your interests.. As it might be convenient to bundle waste disposal and recycling services, you may wish to explore available options with your existing waste disposal contractor first before sourcing for other companies.



Contamination of Recyclables

Contamination e.g. by food waste or remnant content lowers the value of recyclable materials, and materials that are badly contaminated cannot be recycled at all. Proper segregation is thus important and containers should be emptied before being deposited into recycling bins. Check with your recycling service provider on the requirements for food contaminated packaging and promote awareness among shoppers and tenants.



CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Step 7: Green Committee to Develop a 3R Programme

With the preparation work outlined in the previous steps completed, you can begin to develop, tailor and document a 3R programme for your mall:

1. List targeted waste streams for waste reduction, reuse and recycling
2. Propose options/methods to reduce, reuse and recycle the identified waste streams and describe each option/method
3. Estimate the costs and/or cost savings involved for each option/method
4. Estimate the quantity of waste reduction (in kg) for each waste stream
5. Plan implementation schedule for each option/method (milestones and timeline for implementation)
6. Examine the requirements for implementation (tasks and staff assignment)
7. Train the personnel involved
8. Consider the requirements by management
9. Set measurable performance indicators and targets
10. Work out a timeline for achieving the targets

A summary table of the proposed 3R Programme can be drawn up as illustrated by the example below.

Table 2: Summary of 3R Programme

Waste Type	Quantity (kg)	Proposed 3R option (Reduce, reuse, recycle)	Waste reduction /reuse/ recycling target (kg)	Estimated costs	Estimated cost savings	Personnel in charge	Start date	End date	Status

Step 8: Green Committee to Implement the 3R Programme

Several important actions are required for a successful implementation of the 3R programme.

Before launching the programme, the recycling initiatives should be well promoted and effectively communicated to tenants and staff.

Communication on 3R Programme



Training sessions should be organised for housekeepers and staff who will be involved in operationalising the 3R programme. Ensure that they understand their roles and take into account their feedback where applicable.

Educating and motivating tenants to practise the 3Rs remains critical to the success of the programme. Wherever possible, face-to-face communication should be arranged with tenants to explain and elaborate on the details of the programme and to engage them on the obligation to align their waste disposal patterns with the policy of the mall.

CHAPTER 3: A STEP-BY-STEP GUIDE TO IMPLEMENTING A 3R PROGRAMME

Promotion of 3R Programme

The official launch of the 3R programme should preferably be presided by the CEO or Managing Director of the mall. Alert tenants and staff about the programme in advance by sending kick-off memos from the management to the retail tenants, announcing the programme and requesting their full participation. The memos should be concise in highlighting the benefits of the 3R Programme and explaining the recycling procedures.

The 3R goals, plans and implementation timeline for the 3R Programme should be displayed prominently in staff offices. Regular updates on the progress of the programme should also be communicated clearly on notice boards for viewing by staff, tenants and the public.

Step 9: Green Committee to Monitor, Evaluate and Improve the 3R Programme

After the 3R programme is up and running, monitoring and evaluation should be carried out on a regular basis.

- **Track the quantity of waste reduced/reused/recycled after the implementation of the 3R Programme**

Request that the recycling service provider forward monthly tonnage reports on the amount of recyclables collected.

- **Calculate cost savings achieved after implementation of the 3R Programme**

Maintain accurate and up-to-date records of the waste disposal fees and recyclable collection fees or revenue. Calculate and record the monthly cost savings in the form of reduced disposal costs and/or revenue obtained from the sale of recyclables.

- **Monitor contamination levels of the recycling bins**

Work with your recyclables collector to report on the contamination levels of each type of recyclables. Perform routine visual inspection of the recyclables to get a gauge of the levels of contamination. If contamination levels are high, engage staff and tenants via educational pamphlets to inform them of what can or cannot be recycled.

With the information collected, solicit feedback from tenants, housekeeping and other staff to evaluate the 3R Programme objectively and make changes where required. You could introduce new ideas and initiatives, or review the waste reduction/reuse/recycling goals based on the progress made in your 3R Programme.

By following the steps in this guidebook, and studying the resource information provided in the References section, we hope that your shopping mall can achieve sizeable cost savings and waste reduction/reuse/recycling, and help contribute towards a sustainable waste management system in Singapore.



Checklist for developing and maintaining a 3R programme

STEP 1: REVIEW THE CURRENT SYSTEM

CHECK	NOTES
<input type="checkbox"/> Establish the location boundaries of the project and tenants involved	
<input type="checkbox"/> Review the current waste collection arrangement <ul style="list-style-type: none"> - Do existing systems (e.g. operations including cleaning & solid waste disposal) handle waste management effectively? - What elements in the current waste collection arrangement can be revised to increase effectiveness and efficiency? 	
<input type="checkbox"/> Determine the types of waste to be recycled	
<input type="checkbox"/> Conduct waste audit	
<input type="checkbox"/> Types and locations of current rubbish/recycling bins	
<input type="checkbox"/> Feedback from shoppers, tenants, cleaners and waste contractors on the current waste collection arrangement	

STEP 2: DESIGN A NEW SYSTEM

CHECK	NOTES
<input type="checkbox"/> Draw up a detailed project plan <ul style="list-style-type: none"> - How will operational procedures be revised or developed to cater for the planned 3R programme? 	
<input type="checkbox"/> Are tenants, cleaners and waste collection contractors involved in the proposed 3R programme?	
<input type="checkbox"/> Does the management give their full understanding and support for the planned 3R programme?	
<input type="checkbox"/> Set targets and objectives	
Deployment of recycling bins <ul style="list-style-type: none"> <input type="checkbox"/> Bin design (lids/openings) <input type="checkbox"/> Bin safety <input type="checkbox"/> Bin placement <input type="checkbox"/> Bin label <input type="checkbox"/> Bin volume <input type="checkbox"/> Number of bins <input type="checkbox"/> Collection frequency <input type="checkbox"/> Differentiation of recycling bins from general refuse bins 	
<input type="checkbox"/> Continued cooperation between bin supplier, waste collection contractor and tenants	

Checklist for developing and maintaining a 3R programme

STEP 3: IMPLEMENTING THE SYSTEM

CHECK	NOTES
<input type="checkbox"/> Set up a communications plan <ul style="list-style-type: none"> - Have the priorities been identified for the target audience? - What are the messages to be communicated? 	
<input type="checkbox"/> Mutual understanding of the roles and responsibilities of tenants, cleaners and waste contractors who will execute and deliver the planned 3R programme	
Promotion of the new infrastructure through <ul style="list-style-type: none"> <input type="checkbox"/> Website <input type="checkbox"/> Media releases <input type="checkbox"/> Posters <input type="checkbox"/> Social media <input type="checkbox"/> Mall events <input type="checkbox"/> Mall directory 	
<input type="checkbox"/> Ensure that all stakeholders have been engaged on the planned 3R programme	

STEP 4: MONITORING AND MAINTAINING THE NEW SYSTEM

CHECK	NOTES
<input type="checkbox"/> Review the implemented 3R programme <ul style="list-style-type: none"> - Have the waste reduction and recycling targets and objectives been met? - Do the contracts with tenants, cleaners and waste recyclables collectors meet the expectations for monitoring and reporting waste and recyclables? 	
<input type="checkbox"/> Waste and recyclables reporting system in place	
<input type="checkbox"/> Conduct waste audit after implementation of the 3R programme	
<input type="checkbox"/> Regular maintenance of the recycling bins	
<input type="checkbox"/> Training of new staff and retraining of old employees	
<input type="checkbox"/> Provide an open channel for communication and feedback among all stakeholders	



References

1. 5 Ways to Reuse Plastic Bottles - Heritage Environmental Services
2. A Guide to Waste Reduction at Shopping Centers – United States, Environment Protection Agency (EPA)
3. Commercial recycling toolkit – Malls and Shopping Centers – Delaware Government
4. Guidelines for public recycling in shopping centres – Queensland Environment Protection Agency
5. Ion Orchard and the Orchard Residences – Penta-Ocean Construction Co.,Ltd.
6. Waste management and reduction guide for the retail industry – Government of South Australia
7. Waste Reduction & Recycling Tips for Shopping Centres and Malls – Wastecare Corporation